AN ANNOTATED LIST OF THE FORMICIDAE (HYMENOPTERA) OF CENTRAL AND SOUTHERN ALBERTA

JANET SHARPLIN
Department of Entomology
University of Alberta

Quaestiones entomologicae
2:243–253 1966

Forty species of ants are recorded in Alberta, with notes on their distribution in the province. The presence of large numbers of the frog Pseudacris triseriata *Agassiz in a nest of* Formica ulkei *Emery is reported.*

Ants were collected all over the region of Alberta southwest of a line between Peace River and Vermillion. No collecting was done on the Alaska Highway north of Peace River; the only other accessible area which was not studied lies between Smoky Lake and Cold Lake. An extensive collection was made in the summer of 1963 and the material was supplemented during shorter field trips in 1964 and 1965. Twenty one numbered ecological areas in the province of Alberta were defined by Strickland (1951). An ant species is recorded as occurring in an ecological area if it is generally distributed throughout that area. Strickland's numbering is used.

Most species were first identified using Creighton's "The Ants of North America" and the original sources referred to by Creighton; Emery (1893, 1895), Gregg (1963) and several works by W.A. Wheeler, were also useful. It was found that most albertan species occur in North Dakota. The determinations were then checked with the excellent discriptions in Wheeler and Wheeler "Ants of North Dakota" (1963). There are 82 indigenous species of Formicidae in North Dakota and 36 of these are also found in Alberta. Another two albertan species (*Formica impexa* and *Manica hunteri*), which do not occur in North Dakota, are distinguished in Wheeler and Wheeler's well illustrated keys. Of the 40 species here recorded for Alberta only 2 species (*Formica subpolita* and *Formica hewitti*) cannot be identified using "The Ants of North Dakota". Of 54 species of ants occurring in British Columbia (G. Ayre pers. com.) only 22 species are shared by Alberta.

My thanks are due to Dr. W. L. Brown, Cornell University, and Dr. E. O. Wilson, Harvard University, for assistance with determinations. I also thank Miss C.A. Sharplin who spent 3 weeks of her 1963 vacation collecting ants.

ECOLOGICAL AREAS IN ALBERTA

The map and descriptions of ecological areas are adapted from Strickland (*in* Bowman 1951) with the help of G.H. LaRoi and J. Packer.

Transition Zone

1. *Cypress Hills* - About 50% forested; lodgepole pine, spruce, aspen, and willow; remainder, long grass. Very little cultivation. Elevation up to 4500 ft. Soil; very dark brown. Summit of hills, an extensive tableland which never glaciated. Rainfall 10-11.4 in. Flora and fauna very similar to those of area 18.

2. *Southern Prairie (dry) (Medicine Hat)* - Short grass. A few poplars, willows, and a variety of bushes in river bottoms; cactus and sage are common, a few yuccas found in the extreme south. Crops: chiefly grain. Deserted land; mustard and Russian thistle. Soil, fine brown clay, sandy in eastern half. Rainfall less than 10 in.

3. *Southern Prairie (about 50% irrigated) (Lethbridge)*- Resembles area 2. Vegetation on dry areas similar, but irrigated parts carry a greater variety of crops, alfalfa and beets predominate. Both soil and rainfall are a little heavier.

4. *Northern Prairie (East) (Steveville)* - Short to moderate long grass; much deserted land. Crops: almost entirely grain. Soil; dark brown loam. Rainfall less than 10 in. Very light in eastern half.

5. *Northern Prairie (West) (Drumheller)* - Moderately long grass. Crops: grain. Soil; heavy clay "gumbo" to dark brown loam. Rainfall, 10-11.5 in.

6. *Northern Prairie (Southwest Extension) (Calgary)* - Moderately long grass, occasional groves of willow and aspen. About 60% under cultivation. Crops: grain and hay. Soil; dark brown loam. Rainfall, 10-11.5 in.

Intermediate Between Transition and Canadian Zones

7. *Parkland (East) (Lloydminster)* - About 30% wooded; aspen and willow groves, most heavily in northern half; remainder, moderately long to short grass. Crops: grain and some hay. Soil; dark brown loam; some areas almost pure sand. Rainfall less than 10 in.

8. *Parkland (West) (Red Deer)* - Originally about 50% wooded; mainly aspen; remainder, long grass; now about 70% cleared. Crops: grain and hay, Soil; dark brown loam. Rainfall 10-13 in.

Canadian Zone

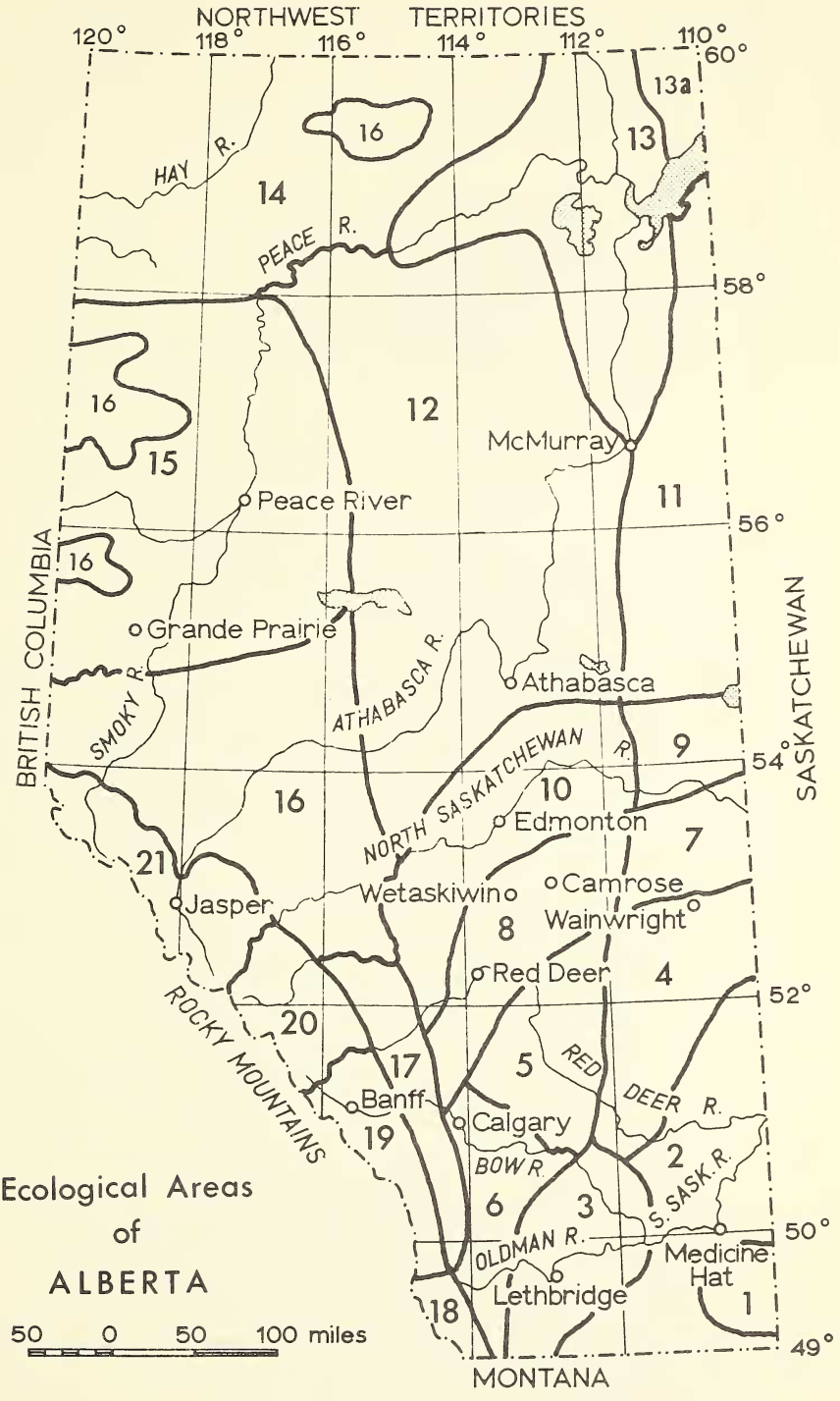
9. *Poplar (East) (Saint Paul)* - Originally, aspen, balsam poplar, and willow, with some spruce; less than 50% cleared. Crops: chiefly oats. Soil; black loam. Rainfall about 10 in.

10. *Poplar (West) (Edmonton)* - Vegetation, as no. 9, larger local stands of spruce and pine; about 70% cleared. Crops: wheat and oats, some hay, particularly clovers. Soil; black loam, with high humus content. Rainfall over 13 in.

11. *Mixed Forest with Eastern and Subartic intrusions*- Poplar, spruce, pine, fir, tamarack, willow, birch, and alder. Soil; gray wooded, large areas of sand. Rainfall, probably 10-11 in.

12. *Mixed Forest with Cordilleran (Rocky Mountain) intrusions (Fawcett)*- Similar to area 11; numerous lakes and large areas of muskeg. A little cultivation in the south. Crops: chiefly oats. Soil; gray wooded, very variable in texture. Rainfall, 11.5 to over 13 in.

13. *Mackenzie lowlands* - Mixed forest, as no. 11, more Alpine - arctic species; long grass and sedges in open spaces. No cultivation. A small


NORTHWEST TERRITORIES
120°
118°
116°
114°
112°
110°
60°
58°
56°
54°
52°
50°
49°
HAY R.
PEACE R.
BRITISH COLUMBIA
SASKATCHEWAN
SMOKY R.
ATHABASCA R.
NORTH SASKATCHEWAN R.
RED DEER R.
BOW R.
S. SASK. R.
OLDMAN R.
ROCKY MOUNTAINS
McMurray
Peace River
Grande Prairie
Athabasca
Edmonton
Wetaskiwin
Camrose
Wainwright
Red Deer
Jasper
Banff
Calgary
Medicine Hat
Lethbridge
MONTANA
13a
13
16
14
12
15
11
9
10
7
21
8
4
20
17
5
19
2
6
3
18
1
Ecological Areas
of
ALBERTA
50 0 50 100 miles

area (13a) of subarctic woodland extends into NE corner. Soil, probably all gray wooded.

14. *Mixed Forest with some Parkland and Alpine–Artic intrusions* - Vegetation resembles nos. 12 and 15. No cultivation.

15. *Mixed Forest and Parkland (Beaverlodge)* - Large mixed forest areas interspersed with long-grass open plains. Crops: chiefly grain and hay. Soil; 10-15% black loam; much gray wooded, scattered patches of sand. Rainfall, 10-13 in.

Foothill Zone

16. *Foothills (Northern) (Edson)* - Vegetation merges from that of no. 11 to that of 21. Some hay and grain in eastern half. Soil; gray wooded. Believed to be very variable. Rainfall over 13 in.

17. *Foothills (Southern)* - Aspen, spruce, lodgepole pine, and willow, with much open prairie towards the southern end. Soil; gray wooded in north merging to dark brown in the south. Rainfall, 13 in. in northern part but less than 10 in. in south.

Mountain Zone

Vegetation - This varies greatly. Montane territory is dominated by lodgepole pine and white spruce. Douglas fir is locally abundant. Subalpine territory is characterized by Engelmann spruce, alpine fir, and other conifers, as well as by mountain heaths.

From area 18 to area 21 there is a gradual replacement of southern and western species by certain boreal and arctic species.

18. *Southern Rocky Mountain (Waterton and Crow's Nest Pass)* - Strong intrusions of southern and western species extend to about the northern limits of this area. Soil; has a higher lime content than have the more northern mountain areas. Rainfall over 13 in.

19. *Central Rocky Mountain (Banff)* - Vegetation typical for entire mountain zone with few southern or Arctic intrusions. Soil; though very variable is, generally speaking, of a gray wooded type. Rainfall over 13 in.

20. *North Central Rocky Mountain (Nordegg)* - Vegetation similar to that of 19 but the late Dr. Malte, Dominion Agrostologist found several species of grasses which had been considered as confined to Labrador growing in the vicinity of Nordegg. Soil and rainfall as in area 19.

21. *Northern Rocky Mountain (Jasper)* - Vegetation, soil, and rainfall as in no. 19, but with strong intrusions of arctic and boreal species.

SUBFAMILY MYRMICINAE

Genus *Myrmica* Latreille (Weber 1950)

Myrmica brevinodis *Emery* - Is a very common ant in areas 1, 5 to 8, 10, 12, and 15 to 21. It is found up to timber line in the Rocky Mountains. Several collections were made in Jasper Park around 7,000 ft. In the drier south-central and southeastern part of the province *M. brevinodis* is less common, being found only in wooded areas or near water.

Myrmica brevispinosa *Wheeler* - Several nests of this species were found in area 10, and one near Milk River (3 Aug. 1963).

Myrmica emeryana *Forel* - Was recorded twice only:- Devon 20 June 1963, and Lake Cardinal provincial park, west of Peace River, 14 Sept. 1964.

Myrmica lobicornis fracticornis *Emery* - Many records of this species were obtained in areas 1, 3, 4 to 8, 10, and 16 to 21. This ant was not found in the hot dry area around Medicine Hat.

Genus *Manica* Jurine

Manica hunteri *Wheeler* - Several nests were found at Gorge Creek in the foothills west of Turner Valley, 24 June 1965. One collection was made in Jasper Park at an elevation of 4,500 ft., Oct. 3 1964.

Manica mutica *Emery* - Was recorded in Alberta by E. H. Strickland but as his specimens are no longer available this record could not be verified.

Genus *Pogonomyrmex* Mayr

Pogonomyrmex occidentalis *(Cresson)* - Was found only in area 2. In this area the large mound nests and clearings are easily seen; the first nest found was spotted from a moving car on Highway 1.

Genus *Monomorium* Mayr

Monomorium minimum *(Buckley)* - One specimen was collected from a thistle leaf near Medicine Hat airfield on 6 Aug. 1963. The nest was not located.

Monomorium pharaonis *(Linnaeus)* - An infestation of "pharoah's ant" was recorded in a building in Lethbridge in 1946 by E. H. Strickland.

Genus *Leptothorax* Mayr

Leptothorax muscorum *(Nylander)* - (Brown 1955:*L. (Mychothorax) canadensis* Provancher in Wheeler and Wheeler 1963). This ant is common in the wooded areas of central and western Alberta.

Lepthothorax ambiguus *Emery* - Was collected only once, at Celestine Lake, Jasper National Park, 24 July 1963.

SUBFAMILY DOLICHODERINAE

Genus *Tapinomo* Forster

Tapinoma sessile *(Say)* - This tiny ant is found in an extraordinary

variety of habitats; Flatbush 23 Aug. 1963 in damp aspen woodland, near the Columbia Ice Field 26 July 1963 at an elevation of 6,400 ft., Writing-on-Stone provincial park 3 Aug. 1963 on the side of the Milk River Canyon, Steveville 7 Aug. 1963 in badlands, and in urban Edmonton. Although widely distributed, this ant is nowhere very common.

SUBFAMILY FORMICINAE

Genus *Camponotus* Mayr

Camponotus herculeanus *(Linnaeus)* - The large dark carpenter ant which is very common in the foothills and on the wooded slopes of the mountains. It is also common in the west central parkland. Numerous records were obtained in areas, 10 and 15 to 21. A few records were obtained east of this line e.g.: Ardrossan 18 Aug. 1963, Tofield 22 Sept. 1965, Flatbush 1 June 1964, but *C. noveboracensis* was more common in these areas.

Camponotus noveboracensis *(Fitch)* - The red and black carpenter and which occurs in areas 7, 8 and 10. The most westerly record was Devon 20 June 1963, most southerly - Drumheller 8 Aug. 1963, and the most northerly - Flatbush 1 June 1964.

Camponotus (Myrmentoma) nearcticus *Emery* - Only one nest of this species was found. It was in a large, old fallen treetrunk in a small patch of woodland on the south bank of the Red Deer River 16 miles west of Drumheller, 8 Aug. 1963.

Genus Lasius *Fabricius* (Wilson 1955)

Lasius alienus *(Forster)* - This species is very common in the foothills, areas 17 and 18. It was found at every one of many stops in a 2-day drive down the forest road from Kananaskis to Coleman. *L. alienus* is abundant in the Gorge Creek area (collected June 24, 1965). Other records for this species are Waterton 3 Aug. 1963, Cypress Hills 5 Aug. 1963, Medicine Hat 6 Aug. 1963, Drumheller 8 Aug. 1963, and Opal 13 July 1963.

Lasius neoniger *Emery* - Is very common in open grassland, areas 2, 3 and 6. Little crater mound nests occur every few yards along the edges of paths and in the open where there is suitable light soil. *L. neoniger* was found in woodland near Elkwater 5 Aug. 1963. This species was also collected in sandy soil at Opal 13 July 1963 over 200 miles further north than the nearest record. Presumably it occurs in between.

Lasius sitkaensis *Pergande* - This species is common in area 10, and it was also found in sheltered habitats in the mountains, e.g. Lake Louise 28 July 1963. *L. sitkaensis* is not found in the open dry areas of the south-eastern region, but was taken in woodland in Kinbrook Island provincial park 6 Aug. 1963 and Elkwater 5 Aug. 1963.

Lasius (Chthonolasius) umbratus *(Nylander)* - Collected only at Lake Newell 6 Aug. 1963. This ant is probably rare in the province; no nests were found during a fruitless search for *Acanthomyops*, in south central Alberta.

Genus *Formica* Linnaeus

Species belonging to the neogagates *group (Wilson and Brown 1955)*

Formica bradleyi *Wheeler* - (subgenus *Proformica* in Wheeler and Wheeler 1963). The only record of this species is Medicine Hat 6 Aug. 1963.

Formica lasioides *Emery* (F. Proformica lasioides) - A nest of *F. lasioides* was found near Mount Eisenhower youth hostel on 28 July 1963. Most of the workers in this nest were about 5 mm long and had many erect white hairs on the scapes. Smaller specimens, between 3 and 4 mm long were collected from Opal 13 July 1963, Lake Newell 6 Aug. 1963 and Elkwater 5 Aug. 1963. Workers from these three localities had fewer erect hairs on the scapes.

Formica neogagates *Emery* (F. Proformica neogagates) - A few individual ants resembling small *F. lasioides* but lacking erect hairs on the scapes were found running on bare open ground in Dinosaur provincial park 7 Aug. 1963. The nest was not located.

Formica obtusopilosa *Emery* (F. Raptiformica obtusopilosa *in Wheeler and Wheeler 1963*) - This species occurs in the southern part of the province where it was collected from Milk River 3 Aug. 1963, Comrey 4 Aug. 1963, Steveville 7 Aug. 1963, and Dinosaur Park 7 Aug. 1963.

Species belonging to the sanguinea *group which is also known as the subgenus* Raptiformica *Forel*

Formica sanguinea subnuda *Emery* - This slave-making species is very common and nests were found in all areas except 9, 11, 13 and 14 in which no ant collecting was done. *Formica fusca* is usually enslaved by this species, but many *sanguinea* nests without slaves were found.

Formica subintegra *Emery* - *F. subintegra* was recorded twice, from Elk Island National Park 14 June 1963 and Ministik Lake 18 Aug. 1963. *F. fusca* was the slave species.

Formica puberula *Emery* - This species was found only once, at Gorge Creek 24 June 1965.

Another species in the *sanguinea* group with a brown head and abdomen and a lighter thorax was collected from Medicine Hat. It could not be identified.

Species belonging to the rufa *group*

Formica dakotensis *Emery (Brown 1957)* - Is common in the foothills of areas 16, 17 and 20. Many nests were found along the Coal Branch Road between Nordegg and Edson (9-12 Aug. 1963). *F. dakotensis* is less common

further south in the foothills, but several nests were found near Kananaskis 1 Aug. 1963. It was collected at Peace River 15 Sept. 1964.

Formica obscuripes *Forel* - This species occurs all over southern Alberta, commonly in areas 1, 2, 3, 6, 17, 18, and 19. *F. obscuripes* makes thatched mound nests and the workers are conspicuously active, biting readily. It is a species that "cannot be missed" and therefore may appear to be more abundant than it really is. The nests were found on sunny grass slopes in the mountains and on open ground in the prairies. The most northerly record of this species in the province is Nordegg 9 Aug. 1963.

Formica obscuriventris *Mayr* - Three nests of this species were found: Mount Eisenhower 28 July 1963, Lake Minnewanka 30 July 1963, and Opal 13 July 1963.

Formica oreas *Wheeler* - One nest of this species was found in 1963 at Rainbow Valley, Edmonton. The site was revisited in 1964 and 1965 but no trace of *F. oreas* was found.

Species belonging to the microgyna *group*

Formica impexa *Wheeler* - Three nests of *F. impexa* were found in a sandy area on the east bank of the Athabasca River about 7 miles west of Flatbush on 23 Aug. 1963. In 1964 the nests were dug into in search of queens, which were not found, and the soil was replaced in the holes. In June 1965 the nests were found to be empty and only two individual *F. impexa* were found in the area. Perhaps this species is particularly susceptible to disturbance of the nest.

Species belonging to the exsecta *group*

Formica opaciventris *Emery* - Was found only once at Lucky Strike, 4 Aug. 1963.

Formica ulkei *Emery* - Is common in area 10. The large mound nests are conspicuous in clearings in woodland and along tree-lined trails. Sticky bud scales from poplars are usually littered over the mounds. Elk Island National Park affords excellent *F. ulkei* habitat. This species was found as far west as Edson 4 July 1963, and at Peace River to the north 15 Sept. 1964, but not in the mountains, in predominantly coniferous forest, nor on the open prairie.

In October 1965 40 frogs (*Pseudacris triseriata maculata* Agassiz) were dug from a sector of an active *F. ulkei* nest at George Lake, 53°58' N 114°05' W. After about one third of the mound had been dug out the frogs and soil were replaced. Two weeks later the nest was reinvestigated and no frogs or ants were found in the mound. Further digging revealed 20 frogs 2 feet below ground level; ants were also found in these deep galleries. After finding 20 frogs, I filled the hole in, but as frogs were turning up in every trowel-full of soil, it was assumed that there were more frogs below the 2-foot depth reached. No frogs were found in a control hole dug 10 feet away from the nest. *F. ulkei* is a vicious biter, but none of

the ants in this nest were attacking the frogs. Other mounds of *F. ulkei* were opened in the early spring of 1965 and in the fall of 1965 but no inquilines, frogs or insects were found.

Species belonging to the fusca *group.*

Formica fusca *Linnaeus* - Is the commonest ant in Alberta. It is found everywhere in the area studied except in area 2. It is, however, common in the Cypress Hills.

Three *F. fusca* nests at Devon were marked with stakes in the fall of 1963. During the first week of February 1964 the snow was cleared from these nests and they were dug out. In one nest ants were found in galleries 3 feet 6 inches below ground level. When warmed up these ants became active. No ants were found in the other two nests although the colonies became active again the following summer. It is probable that the ants were 4 ft. or more below ground level.

Formica cinerea montana *Emery* - (Gregg 1953) - Was found in three locations in the south of the province:- 5 miles northeast of Waterton 3 Aug. 1963, Lucky Strike 4 Aug. 1963, and Milk River 3 Aug. 1963. A nest of *F. cinerea* was also found on a south-facing embankment on the edge of a gravel road at Gorge Creek 24 June 1965.

Formica neoclara *Emery* - A common species in areas 16 to 21 inclusive. *F. neoclara* was also collected in Calgary in July 1964 and Drumheller 8 Aug. 1963.

Formica neorufibarbis *Emery* - Is the most common ant in the Rocky Mountain forests, areas 18 to 21. *F. neorufibarbis* varies in size and colouration with altitude. This phenomenon was studied between July 19 and 25 in Jasper Park in 1965. *F. neorufibarbis* is most abundant between 4,000 and 5,000 feet, but was collected above the tree line at 8,000 feet and in a valley at 3,400 feet. Large, well-established nests from different altitudes were compared. The majority of workers from the 6,500 to 8,000 foot level were between 6 and 7 mm long. The thorax of all workers was markedly lighter than the head and abdomen; 58 out of 317 individuals collected from the highest nests had a clear yellow thorax, the others had a yellowish brown thorax and yellow legs. The ants from nests found in the valley were smaller, 4.5 to 5.5 mm long. Twelve out of 357 had yellow thoraces, but some of these showed some infuscation of the nota. Many low altitude ants had a brown thorax, which although it was lighter than the head and abdomen did not give a bicoloured impression in the field. Intermediate forms occur at intermediate altitudes and I am convinced that only one species is involved, although the smaller, darker forms were confused with *F. marcida* Wheeler at first. *F. neorufibarbis* was also taken well away from the mountains at Sandy Lake, elevation about 2,000 ft., 5 June 1963.

Formica subpolita *Mayr* - Was recorded twice at Comrey, 4 Aug. 1963, and Medicine Hat, 6 Aug. 1963.

Formica hewitti *Wheeler* - Scattered records of this species were obtained, all from wooded areas:- Flatbush 23 Aug. 1963, Vimy 24 April 1964, Mount Edith Cavell 2 Oct. 1964, near Mount Eisenhower 28 July

1963, and Cypress Hills 5 Aug. 1963.

Genus *Polyergus* Latreille

Polyergus rufescens *Latreille* - This slave-making species was found in five large *Formica fusca* nests in different localities:- Devon 20 June 1963, Flatbush 23 Aug. 1963 (young queens were found in this nest), bank of Athabasca River 7 miles west of Flatbush 23 Aug. 1963 (winged males were present in this nest), Celestine Lake trail, Jasper, 24 July 1963 (dwarf *F. fusca* males were numerous in this nest), and Elk Island Park 10 July 1963.

REFERENCES

Brown, W. L. 1955. The ant *Leptothorax muscorum* (Nylander) in North America. Ent. News 66 : 43-50.

Brown, W. L. 1957. Distribution and variation of the ant *Formica dakotensis* Emery. Ent. News 68 : 165-167.

Creighton, W. S. 1950. The ants of North America. Bull. Mus. comp. Zool. Harvard 104 : 1-585, 57 pl.

Emery, C. 1893. Beitrage zur Kentniss der nordamerikanischen Ameisen - fauna. Zool. Jb. 7 : 633-682.

Emery, C. 1895. Beitrage zur Kentniss der nordamerikanischen Ameisen - fauna. Zool. Jb. 8 : 257-360.

Gregg, R. E. 1953. Morphological considerations affecting the taxonomy of certain genera of ants (Hymenoptera, Formicidae). Proc. ent. Soc. Wash. 55 : 324-330. 2 figs.

Gregg, R. E. 1963. The ants of Colorado. University of Colorado Press. 792 pp. 25 pl.

Strickland, E. H. *in* Bowman, K. 1951. An annotated list of the Lepidoptera of Alberta. Can. J. Zool. 29 : 121 - 165. 21 refs.

Weber, N. A. 1950. A revision of the North American ants of the genus *Myrmica* Latreille with a synopsis of the Palearctic species. Ann. ent. Soc. Amer. 43 : 189-225. 1 fig.

Wheeler, G. C. and Wheeler, J. 1963. The ants of North Dakota. University of North Dakota Press, Grand Forks. 326 pp. 81 maps, many figs.

Wheeler, W. M. 1903. A revision of the North American ants of the genus *Leptothorax* Mayr. Proc. Acad. Nat. Sci. Philadelphia. 4 : 215-260.

Wheeler, W. M. 1912. New names for some ants of the genus *Formica*. Psyche, Camb. 19, p. 90.

Wheeler, W. M. 1913. A revision of the ants of the genus *Formica* (Linne) Mayr. Bull. Mus. comp. Zool. Harvard. 53 : 379-565.

Wheeler, W. M. 1914. The American species of *Myrmica* allied to *M. rubida* Latreille. Psyche, Camb. 21 : 118-122.

Wilson, E. O. and Brown, W. L. 1955. Revisionary notes on the *sanguinea*